

Weekly Activities Summary
Amendment 2 - Full Scale Field Demonstration
Interim Combined Acid Drainage Treatability Study Work Plan
Leviathan Mine Site
Alpine County, California

Week: August 19 – August 25, 2017

The following text describes field activities conducted during August 19 through August 25, 2017, to implement Amendment No. 2 to the Interim Combined Acid Drainage Treatability Investigation Work Plan, which Atlantic Richfield submitted to U.S. EPA on March 31, 2017.

INTERIM COMBINED TREATMENT OPERATIONS

OPERATIONAL SUMMARY

- The target level of 4.5 feet per the USGS gauge was reached on August 19, 2017. Operation of the HDS Treatment Plant was temporarily suspended, and transfer of Upper Pond water from Pond 2S to Pond 4 began.
- The target acidity of >2,900 mg/L in Pond 4 was reached on August 20, 2017, and water transfer from Pond 2S to Pond 4 was shut down.
- The HDS Treatment Plant was re-started on August 21, 2017, at a treatment flow rate of approximately 90 gpm to allow the plant to stabilize. Water transfer from Pond 2S to Pond 4 resumed, and water transfer from Leviathan Creek to Pond 4 (at a flow rate of approximately 3 gpm) was also initiated.
- The HDS Treatment Plant treatment influent flow rate was increased to 143 gpm on August 22, 2017. Atlantic Richfield began performing daily effluent sampling.
- Due to a reduction in the sludge percent solids in the HDS Treatment Plant clarifier from approximately 20% to 5% over five days, Atlantic Richfield halted water transfers from Pond 2S to Pond 4 on August 25, 2017. Atlantic Richfield will continue treating the combined water remaining in Pond 4, but we will not utilize any more water from the upper ponds (Pond1, 2N or 2S) this year. The LRWQCB and U.S. EPA were informed of this by email at 5:19 PDT on August 25, 2017. Results of the ICT Demonstration will be reported as specified in the Work Plan.

HDS TREATMENT PLAN OPERATIONS SUMMARY

- HDS Treatment Plant operations experienced the following short-term interruptions between August 19 and August 25, 2017:
 - Approximately 13.6 hours on August 19, 2017, 24 hours on August 20, 2017, and 9.7 hours on August 21, 2017, during a short-term shutdown initiated to transfer water from Pond 2S to Pond 4.

- Approximately 1.6 hours on August 23, 2017 and 7.4 hours on August 24, 2017, due to high clarifier pH plant trip.
- Approximately 1.3 hours on August 24, 2017 and 8.0 hours on August 25, 2017, due to high clarifier pH plant trip.
- The HDS Treatment Plant was placed in recycle mode returning effluent to Pond 4 following short-term interruptions between August 19 and August 25, 2017:
 - Approximately 1.8 hours on August 21, 2017, after restarting the plant following the short-term shutdown initiated to transfer water from Pond 2S to Pond 4.
 - Approximately 5.5 hours on August 24, 2017, after restarting the plant following high clarifier pH plant trip and to lower the sludge bed level in the clarifier.
 - Approximately 3.0 hours on August 25, 2017, after restarting the plant following high clarifier pH plant trip.
- The remainder of the time, the HDS Treatment Plant was discharging to Leviathan Creek.
- Capture and conveyance of the CUD and DS were maintained uninterrupted throughout this period.

SAMPLING SUMMARY

- HDS Treatment Plant ICT sampling was performed on August 21, 22, 23, 24, and 25, 2017.
- Sampling results received to date are provided in Table 1. A summary of the HDS Treatment Plant effluent field monitoring is presented in Table 2. Flow volumes recorded for the Channel Underdrain, Delta Seep, Leviathan Creek diversion, Upper Pond water transfer, and treated water discharged from the HDS Treatment Plant are included in Table 3. An Interim Combined Treatment operational summary is presented in Table 4.

SLUDGE DISPOSAL SUMMARY

- Two sludge bins totaling approximately 26 cubic yards, were transported for off-site disposal at US Ecology in Beatty, NV on August 21, 2017.
- One sludge bins totaling approximately 14 cubic yards, was transported for off-site disposal at US Ecology in Beatty, NV on August 23, 2017.
- Sludge wasting volumes are also included in Table 4.

SCHEDULE

- Treat the remaining water in Pond 4 over the next week, and then return to normal HDS Treatment Plant operations treating primarily CUD / DS water.

- Begin evaluating the data gathered and initiate preparation of the ICT Demonstration Report. The ICT Demonstration Report is anticipated to be submitted in December 2017.

TABLE 1
HDS TREATMENT PLANT - PRELIMINARY INTERIM COMBINED TREATMENT SAMPLE RESULTS
Leviathan Mine Site
Alpine County, California
Draft - Provisional Data

Parameter	Basis	July 07, 2017 HDSICT-1 HDS Influent mg/L	July 07, 2017 HDSICT-2 HDS Effluent mg/L	July 10, 2017 HDSICT-1 HDS Influent mg/L	July 10, 2017 HDSICT-2 HDS Effluent mg/L	July 10, 2017 UPCS-2 Pond 2S mg/L	July 11, 2017 HDSICT-1 HDS Influent mg/L	July 11, 2017 HDSICT-2 HDS Effluent mg/L	July 11, 2017 UPCS-2 Pond 2S mg/L	July 12, 2017 HDSICT-1 HDS Influent mg/L	July 12, 2017 HDSICT-2 HDS Effluent mg/L	July 12, 2017 UPCS-2 Pond 2S mg/L
pH (s.u.) ¹	Field	2.76	7.64	2.68	7.91	2.42	2.66	7.51	2.42	2.71	8.01	2.42
Aluminum	Dissolved	250	<1.0	160	0.57	490	161	0.327	542	216	0.632	494
Arsenic	Dissolved	2.6	0.0017	0.68	0.0019	7.6	1.23	0.00206	8.33	1.38	0.0018	8.66
Cadmium	Dissolved	0.037	0.00028 J	0.022	<0.001	0.089	0.0257	0.000299	0.0913	0.027	0.000158	0.0953
Calcium	Dissolved	300	1000	310	1000	190	286	820	179	372	952	222
Chloride	Total	6.7	2.6	2.9	1.9	4.9	<10	<10	<20	2 J	1.8 J	<10
Chromium	Dissolved	0.38	<0.002	0.3	0.00091 J	1.4	0.399	0.00016 J	1.59	0.423	0.0001 J	1.57
Copper	Dissolved	1	0.0014 J	0.81	0.0038	3.2	0.999	0.00186	3.5	0.985	0.00109	3.41
Hardness	Dissolved	1000	2800	1000	2800	740	1030	2350	706	1130	2240	765
Iron	Dissolved	610	<1.0	440	<0.50	960	541	0.171	1110	636	0.041	1190
Lead	Dissolved	0.0021	<0.001	<0.005	<0.001	<0.02	0.00124	0.000029	0.00423	0.00119	0.000006 J	0.0041
Magnesium	Dissolved	80	110	78	77	61	76.6	73.8	62.8	97.4	69.7	73.5
Nickel	Dissolved	2.5	0.15	3.1	0.1	5.8	3.42	0.117	6.55	3.52	0.0608	6.41
Selenium	Total	0.0089	0.002	0.0084	0.0019 J	0.012	0.0029 J	0.0018	0.0053	0.0027 J	0.0019	0.0055
Sulfate	Total	4100	3000	3000	2700	5900	1480	2660	3390	2050	2880	4850
Zinc	Dissolved	0.73	0.0064 J	0.71	0.0028 J	1.4	0.763	0.0014 J	1.34	0.787	0.0004 J	1.37
Acidity	Total	2800	<2.0	2200	<2.0	5300	2380	2	5670	2380	2	5700
Alkalinity (Bicarbonate)	Total	<4.8	37	<4.8	13	<4.8	<2	12	<2	<2	12.3	<2
Alkalinity (Carbonate)	Total	<2.4	<2.4	<2.4	<2.4	<2.4	<2	<2	<2	<2	<2	<2
Alkalinity (Hydroxide)	Total	<1.4	<1.4	<1.4	<1.4	<1.4	<2	<2	<2	<2	<2	<2
Alkalinity (Total)	Total	<4.0	30	<4.0	11	<4.0	<2	12	<2	<2	12.3	<2
Total Dissolved Solids	Total	5800	4400	4700	4500	9100	5110	4130	8780	4900	4280	9690
Total Suspended Solids	Total	44	36	110	16	28	28	31	8.5	25.5	38	8.5

Notes:

1. pH values are field measurements and are reported in standard units.
2. Discharge criteria and basis for maximum and average values are listed in the Request for Approval of Modification to the Removal Action at the Leviathan Mine Memorandum (U.S. EPA, 2008).

Abbreviations:

< - Constituents that were not detected are listed as "<" and the reporting limit is shown.
J - Results noted with "J" are an estimated value or were less than the reporting limit but greater than or equal to the method detection limit.

TABLE 1
HDS TREATMENT PLANT - PRELIMINARY INTERIM COMBINED TREATMENT SAMPLE RESULTS
Leviathan Mine Site
Alpine County, California
Draft - Provisional Data

Parameter	Basis	July 13, 2017 HDSICT-1 HDS Influent mg/L	July 13, 2017 HDSICT-2 HDS Effluent mg/L	July 13, 2017 UPCS-2 Pond 2S mg/L	July 14, 2017 HDSICT-1 HDS Influent mg/L	July 14, 2017 HDSICT-2 HDS Effluent mg/L	July 14, 2017 UPCS-2 Pond 2S mg/L	July 19, 2017 HDSICT-1 HDS Influent mg/L	July 19, 2017 HDSICT-2 HDS Effluent mg/L	July 20, 2017 HDSICT-1 HDS Influent mg/L	July 20, 2017 HDSICT-2 HDS Effluent mg/L	July 26, 2017 HDSICT-1 HDS Influent mg/L	July 26, 2017 HDSICT-2 HDS Effluent mg/L
pH (s.u.) [†]	Field	2.71	8.18	2.45	2.62	8.19	2.41	2.74	8.32	2.75	8.21	2.85	8.44
Aluminum	Dissolved	250	0.68	540	310	0.48 J	690	149	1	156	0.491	85.5	0.697
Arsenic	Dissolved	2.4	0.0016	8.6	2.5	0.0026	9.2	1.01	0.00194	0.726	0.00131	0.327	0.0006
Cadmium	Dissolved	0.035	<0.001	0.091	0.037	<0.001	0.087	0.023	0.000066	0.0209	0.00012	0.00795	0.00043
Calcium	Dissolved	310	1500	220	360	1400	260	338	1060	376	977	313	731
Chloride	Total	12	<10	12	12	<10	12	2.6	2.3	2.6	2.3	2.3	2
Chromium	Dissolved	0.53	<0.002	1.4	0.41	<0.002	1.5	0.357	0.00009 J	0.318	0.00019 J	0.108	0.0001 J
Copper	Dissolved	1.1	0.0044	2.9	0.88	0.001 J	3.3	0.817	0.00047	0.704	0.00044	0.232	0.00022
Hardness	Dissolved	1100	3500	810	1400	3900	930	1180	2910	1280	2750	1100	2280
Iron	Dissolved	630	<0.50	1200	760	<0.50	1400	489	0.122	482	0.011 J	287	0.068
Lead	Dissolved	<0.005	<0.001	<0.01	0.0018	<0.001	0.0042	0.001	0.00008 J	0.00082	0.000056	0.00027	0.000019 J
Magnesium	Dissolved	85	77	76	100	68	99	80.1	65.6	83.1	76	79.8	66.1
Nickel	Dissolved	3.2	0.05	5.4	2.5	0.049	6.4	3.16	0.0219	3.07	0.0324	2.52	0.0148
Selenium	Total	0.0044 J	0.0021	0.0067 J	<0.02	0.0028	0.0057 J	0.0027 J	0.0017	0.0026 J	0.0017	0.0019 J	0.0013
Sulfate	Total	3700	2800	6200	4200	3600	6800	2520	3200	1430	1460	2220	2280
Zinc	Dissolved	0.82	0.003 J	1.3	0.74	<0.02	1.1	0.715	0.0004 J	0.692	0.0009 J	0.574	0.0007 J
Acidity	Total	2800	<2.0	5700	3100	<2.0	5800	2250	2	2160	2	1460	2
Alkalinity (Bicarbonate)	Total	<4.8	10	<4.8	<4.8	9.5	<4.8	<2	13.5	<2	11.7	<2	21.7
Alkalinity (Carbonate)	Total	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2	<2	<2	<2	<2	<2
Alkalinity (Hydroxide)	Total	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<2	<2	<2	<2	<2	<2
Alkalinity (Total)	Total	<4.0	8.5	<4.0	<4.0	7.8	<4.0	<2	13.5	<2	11.7	<2	21.7
Total Dissolved Solids	Total	5800	5200	9500	6000	4200	9300	4770	4240	4580	3810	3730	3390
Total Suspended Solids	Total	52	6.3	32	43	240	10	43	65.5	12.5	22.5	101	6

TABLE 1
HDS TREATMENT PLANT - PRELIMINARY INTERIM COMBINED TREATMENT SAMPLE RESULTS
Leviathan Mine Site
Alpine County, California
Draft - Provisional Data

Parameter	Basis	August 02, 2017 HDSICT-1 HDS Influent mg/L	August 02, 2017 HDSICT-2 HDS Effluent mg/L	August 03, 2017 HDSICT-1 HDS Influent mg/L	August 03, 2017 HDSICT-2 HDS Effluent mg/L	August 03, 2017 UPCS-2 Pond 2S mg/L	August 04, 2017 HDSICT-1 HDS Influent mg/L	August 04, 2017 HDSICT-2 HDS Effluent mg/L	August 04, 2017 UPCS-2 Pond 2S mg/L	August 05, 2017 HDSICT-1 HDS Influent mg/L	August 05, 2017 HDSICT-2 HDS Effluent mg/L	August 05, 2017 UPCS-2 Pond 2S mg/L
pH (s.u.) [†]	Field	2.68	8.37	2.42	8.33	2.05	2.55	8.48	2.30	2.54	8.4	2.23
Aluminum	Dissolved	210	1.3	190	1.2	590	200	1.9	550	220	2.0	600
Arsenic	Dissolved	2.6	0.0024	2.5	0.0019	12	2.7	0.0031	12	2.4	0.0024	13
Cadmium	Dissolved	0.032	<0.001	0.03	<0.001	0.11	0.032	<0.001	0.11	0.032	<0.001	0.12
Calcium	Dissolved	370	1300	370	1200	240	370	1200	220	380	1300	230
Chloride	Total	10	3.3 J	5.1	<100	13	4.4	2.6	15	5.0	2.7	7.8
Chromium	Dissolved	0.43	<0.002	0.43	<0.002	1.6	0.44	<0.002	1.6	0.45	<0.002	1.8
Copper	Dissolved	0.81	0.0041	0.82	0.0029	3.1	0.87	0.003	3.2	0.87	0.0036	3.5
Hardness	Dissolved	1300	3400	1200	3000	890	1200	3200	830	1300	3800	930
Iron	Dissolved	480	<0.50	460	<0.50	1200	520	<0.50	1200	510	<0.50	1200
Lead	Dissolved	0.001	<0.001	0.0009 J	<0.001	<0.005	0.00093 J	<0.001	0.0054	0.00096 J	<0.001	0.0035 J
Magnesium	Dissolved	77	65	71	57	82	77	53	78	78	50	82
Nickel	Dissolved	2.7	0.031	2.6	0.022	6.7	2.8	0.015	6.9	2.8	0.017	7.5
Selenium	Total	0.014	0.0028	0.0036	0.0029	0.006	0.0037	0.0029	0.0066	0.0037	0.003	0.0071 J
Sulfate	Total	3700	3300	3700	3100	7000	3400	2500	9600	3800	3100	7600
Zinc	Dissolved	0.68	0.004 J	0.63	<0.02	1.4	0.66	<0.02	1.5	0.67	0.0048 J	1.6
Acidity	Total	2500	<2.0	2400	<2.0	6100	2600	<2.0	6800	2600	<2.0	6200
Alkalinity (Bicarbonate)	Total	<4.8	14	<4.8	14	<4.8	<4.8	17	<4.8	<4.8	17	<4.8
Alkalinity (Carbonate)	Total	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4
Alkalinity (Hydroxide)	Total	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
Alkalinity (Total)	Total	<4.0	12	<4.0	12	<4.0	<4.0	14	<4.0	<4.0	14	<4.0
Total Dissolved Solids	Total	5700	5000	5400	4900	10000	5700	4500	11000	5000	4700	10000
Total Suspended Solids	Total	35	18	32	17	28	32	33	32	36	37	31

TABLE 1
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Leviathan Mine Site
Alpine County, California
Draft - Provisional Data

Parameter	Basis	August 07, 2017 HDSICT-1 HDS Influent mg/L	August 07, 2017 HDSICT-2 HDS Effluent mg/L	August 08, 2017 HDSICT-1 HDS Influent mg/L	August 08, 2017 HDSICT-2 HDS Effluent mg/L	August 09, 2017 HDSICT-1 HDS Influent mg/L	August 09, 2017 HDSICT-1 HDS Effluent mg/L	August 10, 2017 HDSICT-1 HDS Influent mg/L	August 10, 2017 HDSICT-2 HDS Effluent mg/L	August 16, 2017 HDSICT-1 HDS Influent mg/L	August 16, 2017 HDSICT-2 HDS Effluent mg/L	August 21, 2017 HDSICT-1 HDS Influent mg/L
pH (s.u.) [†]	Field	2.49	8.46	2.73	8.45	2.75	8.47	2.88	8.48	NA	NA	NA
Aluminum	Dissolved	190	1.8	160	1.3	140	1.5	NA	NA	94	1.2	NA
Arsenic	Dissolved	1.7	0.0018	1.2	0.0021	0.85	0.0017	NA	NA	0.23	0.00087 J	NA
Cadmium	Dissolved	0.027	<0.001	0.022	<0.001	0.018	<0.001	NA	NA	0.006	<0.001	NA
Calcium	Dissolved	370	1300	390	1200	370	970	NA	NA	410	940	NA
Chloride	Total	3.9	2.0	4.0	2.7	4.6	3.3	NA	NA	3.8 J	2.0 J	NA
Chromium	Dissolved	0.4	<0.002	0.31	<0.002	0.24	<0.002	NA	NA	0.077	<0.002	NA
Copper	Dissolved	0.79	0.0033	0.6	0.0032	0.51	0.0091 J	NA	NA	0.15	0.0011 J	NA
Hardness	Dissolved	1200	3800	1300	3200	1200	2600	NA	NA	1300	2800	NA
Iron	Dissolved	470	<0.50	460	<0.50	400	<0.20	NA	NA	390	<0.20	NA
Lead	Dissolved	<0.002	<0.001	0.00064 J	<0.001	<0.002	<0.001	NA	NA	<0.001	<0.001	NA
Magnesium	Dissolved	78	58	78	57	73	49	NA	NA	82	68	NA
Nickel	Dissolved	2.9	0.017	2.5	0.025	2.4	0.014	NA	NA	1.7	0.019	NA
Selenium	Total	0.0035 J	0.0028	0.0083 J	0.0019 J	0.01	0.0019 J	NA	NA	0.0087	0.0012 J	NA
Sulfate	Total	3600	3100	3200	2600	3100	2600	NA	NA	2800	2300	NA
Zinc	Dissolved	0.65	0.0091 J	0.59	<0.02	0.53	<0.02	NA	NA	0.41	<0.02	NA
Acidity	Total	2300	<2.0	1900	<2.0	1900	<2.0	NA	NA	1400	<2.0	NA
Alkalinity (Bicarbonate)	Total	<4.8	16	<4.8	19	<4.8	26	NA	NA	<4.8	18	NA
Alkalinity (Carbonate)	Total	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	NA	NA	<2.4	<2.4	NA
Alkalinity (Hydroxide)	Total	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	NA	NA	<1.4	<1.4	NA
Alkalinity (Total)	Total	<4.0	14	<4.0	<1.4	<4.0	21	NA	NA	<4.0	15	NA
Total Dissolved Solids	Total	5200	4000	4800	4500	4500	3900	NA	NA	4100	3600	NA
Total Suspended Solids	Total	38	18	47	27	54	20	NA	NA	23	16	NA



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Leviathan Mine Site
Alpine County, California
Draft - Provisional Data

Parameter	Basis	August 21, 2017 HDSICT-2 HDS Effluent mg/L	August 22, 2017 HDSICT-1 HDS Influent mg/L	August 22, 2017 HDSICT-2 HDS Effluent mg/L	August 23, 2017 HDSICT-1 HDS Influent mg/L	August 23, 2017 HDSICT-2 HDS Effluent mg/L	August 23, 2017 UPSCS-2 Pond 2S mg/L	August 24, 2017 HDSICT-1 HDS Influent mg/L	August 24, 2017 HDSICT-2 HDS Effluent mg/L	August 24, 2017 UPSCS-2 Pond 2S mg/L
pH (s.u.) [†]	Field	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aluminum	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hardness	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	Dissolved	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acidity	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (Bicarbonate)	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (Carbonate)	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (Hydroxide)	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (Total)	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Dissolved Solids	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Suspended Solids	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA



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Leviathan Mine Site
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Parameter	Basis	August 25, 2017 HDSICT-1 HDS Influent mg/L	August 25, 2017 HDSICT-2 HDS Effluent mg/L	August 25, 2017 UPCS-2 Pond 2S mg/L	Maximum Discharge Criteria ² mg/L	Average Discharge Criteria ² mg/L
pH (s.u.) ¹	Field	NA	NA	NA	6.0 - 9.0	-
Aluminum	Dissolved	NA	NA	NA	4	2.0
Arsenic	Dissolved	NA	NA	NA	0.340	0.15
Cadmium	Dissolved	NA	NA	NA	0.0090	0.004
Calcium	Dissolved	NA	NA	NA	-	-
Chloride	Total	NA	NA	NA	-	-
Chromium	Dissolved	NA	NA	NA	0.970	0.31
Copper	Dissolved	NA	NA	NA	0.026	0.016
Hardness	Dissolved	NA	NA	NA	-	-
Iron	Dissolved	NA	NA	NA	2	1.0
Lead	Dissolved	NA	NA	NA	0.136	0.005
Magnesium	Dissolved	NA	NA	NA	-	-
Nickel	Dissolved	NA	NA	NA	0.84	0.094
Selenium	Total	NA	NA	NA	NP	0.005
Sulfate	Total	NA	NA	NA	-	-
Zinc	Dissolved	NA	NA	NA	0.21	0.21
Acidity	Total	NA	NA	NA	-	-
Alkalinity (Bicarbonate)	Total	NA	NA	NA	-	-
Alkalinity (Carbonate)	Total	NA	NA	NA	-	-
Alkalinity (Hydroxide)	Total	NA	NA	NA	-	-
Alkalinity (Total)	Total	NA	NA	NA	-	-
Total Dissolved Solids	Total	NA	NA	NA	-	-
Total Suspended Solids	Total	NA	NA	NA	-	-

TABLE 2
HDS TREATMENT PLANT - EFFLUENT FIELD MONITORING
 Leviathan Mine Site
 Alpine County, California
 Draft - Provisional Data

Date	Time	HDS Treatment Plant Effluent Field Monitoring			
		Flow ¹ (gpm)	pH ² (s.u.)	Dissolved Iron ³ (mg/L)	Turbidity (NTU) ⁴
07/07/17	9:25 AM	40.0	7.21	0.02	4.7
07/08/17	7:35 AM	70.0	7.50	0.44	3.8
07/09/17	7:50 AM	70.0	7.60	0.07	4.0
07/10/17	8:00 AM	70.0	7.31	0.17	15.3
07/10/17	4:30 PM	143.0	7.62	0.09	1.7
07/11/17	6:20 AM	143.0	8.05	0.58	3.0
07/11/17	6:10 PM	143.0	8.12	0.65	1.7
07/12/17	6:15 AM	143.0	7.99	0.06	2.3
07/12/17	6:00 PM	143.0	8.11	0.09	2.8
07/13/17	6:10 AM	143.0	7.96	0.11	2.6
07/13/17	6:10 AM	143.0	7.95	0.11	2.6
07/13/17	6:00 PM	143.0	8.01	0.04	2.5
07/14/17	6:50 AM	143.0	7.71	0.04	4.9
07/14/17	7:00 PM	143.0	8.35	0.57	2.1
07/15/17	7:00 PM	123.0	8.38	0.03	1.4
07/16/17	6:00 PM	100.0	8.01	< 0.03	3.7
07/17/17	6:20 AM	100.0	8.28	< 0.03	3.3
07/17/17	7:00 PM	100.0	8.18	< 0.03	2.5
07/18/17	6:15 AM	100.0	8.50	< 0.03	10.1
07/18/17	4:30 PM	100.0	7.91	0.14	2.57
07/19/17	5:15 PM	100.0	7.81	0.06	2.26
07/20/17	6:45 AM	100.0	8.06	< 0.03	3.44
07/20/17	3:50 PM	100.0	7.73	< 0.03	2.73
07/21/17	7:45 AM	100.0	8.16	0.17	4.8
07/21/17	3:00 PM	100.0	8.05	< 0.03	4.07
07/22/17	7:30 AM	100.0	8.09	0.05	3.64
07/23/17	7:00 AM	100.0	8.36	0.04	3.11
07/24/17	7:50 AM	100.0	NA	0.03	NA
07/25/17	8:15 AM	100.0	8.53	0.03	4.61
07/26/17	8:10 AM	100.0	8.54	0.06	7.69
07/27/17	--	--	--	--	--
07/28/17	--	--	--	--	--
07/29/17	2:00 PM	120.0	8.39	0.09	14.9
07/30/17	8:45 AM	120.0	8.38	0.09	6.33
07/31/17	8:30 AM	100.0	8.33	< 0.03	13.8
08/01/17	8:25 AM	100.0	8.27	< 0.03	2.33
08/01/17	5:45 PM	100.0	7.99	0.19	38.4
08/02/17	7:30 AM	100.0	8.17	< 0.03	1.53
08/02/17	1:35 PM	143.0	8.3	0.06	1.34
08/03/17	7:20 AM	143.0	8.27	< 0.03	1.38
08/03/17	12:30 PM	143.0	8.33	0.03	0.58
08/03/17	6:10 PM	75.0	8.4	NA	NA
08/04/17	7:45 AM	75.0	8.42	0.04	2.61
08/04/17	4:10 PM	100.0	8.49	< 0.03	NA
08/05/17	7:30 AM	100.0	8.47	< 0.03	9.2
08/05/17	1:30 PM	75.0	8.42	--	1.0
08/06/17	8:34 AM	75.0	8.39	< 0.03	2.5
08/06/17	12:00 PM	75.0	7.94	--	11.1
08/07/17	8:20 AM	75.0	8.61	0.04	6.9
08/07/17	1:00 PM	100.0	8.48	--	2.2
08/07/17	6:00 PM	110.0	8.41	0.05	0.8
08/08/17	7:40 AM	100.0	8.63	< 0.03	25.6
08/08/17	5:30 PM	100.0	8.40	0.03	0.5
08/09/17	7:15 AM	100.0	8.46	< 0.03	0.5
08/09/17	12:00 PM	100.0	8.61	< 0.03	0.3
08/10/17	11:35 AM	100.0	8.63	< 0.03	0.7
08/10/17	6:00 PM	150.0	8.57	0.03	0.6
08/11/17	7:30 AM	125.0	8.64	< 0.03	0.8
08/11/17	1:05 PM	150.0	8.72	--	--
08/12/17	2:25 PM	90.0	8.69	< 0.03	15.7
08/13/17	7:35 AM	90.0	8.56	< 0.03	9.0
08/13/17	11:20 AM	120.0	8.52	--	--
08/13/17	2:05 PM	90.0	8.42	--	--
08/14/17	7:55 AM	90.0	8.33	< 0.03	1.2
08/14/17	11:30 AM	140.0	8.52	--	1.6
08/15/17	3:25 PM	100.0	8.49	< 0.03	1.4
08/16/17	7:55 AM	100.0	8.56	< 0.03	3.3
08/16/17	3:00 PM	125.0	8.40	--	--
08/17/17	8:00 AM	125.0	8.37	< 0.03	10.1
08/18/17	8:10 AM	125.0	8.31	< 0.03	6.9
08/19/17	8:00 AM	150.0	8.42	0.03	11.0
08/20/17	--	--	--	--	--
08/21/17	11:30 AM	70.0	8.09	< 0.03	21.3
08/21/17	2:10 PM	90.0	7.95	< 0.03	12.3
08/21/17	5:20 PM	90.0	8.24	0.03	9.5
08/22/17	7:45 AM	90.0	8.22	0.03	6.8
08/22/17	12:50 PM	143.0	8.16	0.07	2.7
08/22/17	5:00 PM	143.0	8.27	0.04	2.8

TABLE 2
HDS TREATMENT PLANT - EFFLUENT FIELD MONITORING
 Leviathan Mine Site
 Alpine County, California
 Draft - Provisional Data

Date	Time	HDS Treatment Plant Effluent Field Monitoring			
		Flow ¹ (gpm)	pH ² (s.u.)	Dissolved Iron ³ (mg/L)	Turbidity (NTU) ⁴
08/23/17	9:20 AM	143.0	8.42	0.06	2.5
08/23/17	11:50 AM	143.0	8.34	0.03	2.4
08/23/17	6:00 PM	143.0	8.40	< 0.03	1.2
08/24/17	6:15 PM	143.0	8.46	< 0.02	0.4
08/25/17	9:10 AM	143.0	8.05	0.11	0.7
08/25/17	11:05 AM	143.0	8.22	< 0.03	5.6
08/25/17	5:00 PM	90.0	8.14	0.08	1.3

Notes:

¹ HDS Treatment Plant influent flow rate measurements are calculated from flow totalizer volume measurements.

² Effluent pH values are field measurements and are reported in standard units. The HDS Treatment Plant pH set point was 8.0 from July 7 through July 13, 2017. It was increased to 8.3 from July 13 through July 24, 2017. It was increased to 8.6 from July 24 through July 27, 2017. It was returned to 8.3 from July 27 through August 4, 2017. It was increased to 8.5 on August 4, 2017, to evaluate improving sludge quality. It was returned to 8.3 on August 21, 2017, and remained there for the rest of the test.

³ Dissolved Iron values are field measurements and are reported in mg/L.

⁴ Turbidity values are field measurements and are reported in NTU.

Abbreviations:

gpm - gallons per minute

s.u. - standard unit

mg/L - milligrams per liter

-- - not applicable, plant not in operation

NA - not available

< - less than

TABLE 3
INTERIM COMBINED TREATMENT VOLUMES
 Leviathan Mine Site
 Alpine County, California
 Draft - Provisional Data

Date	CUD Collection Volume	DS Collection Volume	Leviathan Creek Diversion Volume	Upper Pond Transfer Volume	Treated Water Discharge from HDS Treatment Plant Recorded Flow ^{1,2}	
	(gallons)	(gallons)	(gallons)	(gallons)	(gpm)	(gallons)
7/5/2017	68,619	22,957	0	115,540	0	0
7/6/2017	70,136	23,188	0	100,204	0	0
7/7/2017 ³	70,235	22,763	1,619	0	39.0	56,121
7/8/2017	70,331	22,738	0	0	70.0	100,774
7/9/2017	70,411	22,299	0	0	70.0	100,738
7/10/2017	70,542	22,242	0	35,000	109.6	157,807
7/11/2017	70,617	22,112	2,959	39,000	142.2	204,716
7/12/2017	70,413	21,686	0	57,750	142.7	205,542
7/13/2017	70,598	22,402	0	100,800	113.6	163,548
7/14/2017	70,698	22,017	6,591	84,480	84.2	121,242
7/15/2017	70,762	29,203	15,663	30,600	100.0	143,928
7/16/2017	70,790	30,773	6,199	21,000	88.7	127,786
7/17/2017	70,872	21,409	0	0	99.8	143,766
7/18/2017	70,911	20,729	0	0	99.7	143,523
7/19/2017	71,055	21,852	0	0	67.4	97,019
7/20/2017	71,083	20,656	0	0	99.4	143,175
7/21/2017	71,117	20,654	0	0	100.0	143,959
7/22/2017	71,110	20,572	0	0	100.0	143,991
7/23/2017	71,204	20,532	0	0	68.2	98,253
7/24/2017	71,273	20,317	0	0	46.0	66,283
7/25/2017	71,346	20,426	0	0	100.0	143,955
7/26/2017	71,353	20,272	0	0	46.7	67,190
7/27/2017	71,356	19,904	622	0	0.0	0
7/28/2017	71,415	19,787	175	0	0.0	0
7/29/2017	71,471	19,939	0	50,026	67.2	96,814
7/30/2017	71,439	19,676	0	14,515	107.3	154,467
7/31/2017	71,417	19,880	0	75,355	100.0	144,000
8/1/2017	71,469	19,638	15,828	88,502	53.4	76,866
8/2/2017	71,535	19,342	24,827	59,674	95.4	137,334
8/3/2017	71,604	19,801	16,344	43,862	121.2	174,530
8/4/2017	71,753	19,073	0	19,786	71.7	103,296
8/5/2017	71,430	20,330	0	17,466	52.4	75,439
8/6/2017	71,905	19,480	0	21,174	73.2	105,359
8/7/2017	71,861	19,198	0	0	62.3	89,732
8/8/2017	71,815	18,576	0	0	89.8	129,327
8/9/2017	71,793	19,161	0	0	102.9	148,138
8/10/2017	71,645	19,401	2,342	0	128.9	185,660
8/11/2017	71,681	18,865	0	0	71.0	102,199
8/12/2017	71,668	19,168	0	0	0.4	540
8/13/2017	71,659	18,106	0	0	61.1	87,928
8/14/2017	71,718	18,246	0	0	57.2	82,376
8/15/2017	71,684	18,741	0	0	42.5	61,200
8/16/2017	71,597	18,374	0	0	114.7	165,138
8/17/2017	71,452	18,157	0	0	132.0	190,028
8/18/2017	71,435	18,252	0	165	130.1	187,335
8/19/2017	71,507	18,125	0	101,717	61.7	88,857
8/20/2017	71,488	18,606	0	68,841	0.0	0
8/21/2017	71,459	18,224	0	0	45.7	65,745
8/22/2017	71,381	18,185	0	26,773	122.1	175,803
8/23/2017	71,325	18,041	1,893	55,098	132.8	191,202
8/24/2017	71,351	17,974	4,513	57,600	57.2	82,306
8/25/2017	71,293	17,824	3,166	40,338	66.5	95,764
Average Flow Rate or Total Discharged	3,702,083	1,059,875	102,741	1,325,268	80.1	5,770,700

Notes:

1. Treated Water Discharge recorded flows are calculated from flow totalizer volume measurements.
2. The average flow rate is reported. Water discharge does not always occur 24 hours per day. The operational flow rate may also vary during the day.
3. Discharge of treated combined water from the HDS Treatment Plant started on July 7, 2017, at approximately 9:53 AM.

Abbreviations:

CUD - Channel Underdrain

HDS - High Density Sludge

DS - Delta Seep

gpm - gallons per minute

TABLE 4
INTERIM COMBINED TREATMENT OPERATIONAL SUMMARY
 Leviathan Mine Site
 Alpine County, California
 Draft - Provisional Data

Date	Influent Flow Setpoint (gpm)	Hours of Operation ^a	Sludge Recycle Setpoint (gpm)	Flocculant Dosage Setpoint (ppm)	Reactor Tank pH ^b (s.u.)	Effluent Tank pH ^b (s.u.)	Effluent Turbidity ^c (NTUs)	Lime Utilization ^d (g/L)	Sludge Waste (gallons)	Sludge Disposed (kg)
7/22/2017	100	24.0	25	2.4	8.30	8.24	2.68	1.55	800	0
7/23/2017	100	16.3	25	2.4	8.12	8.05	3.59	1.51	1200	0
7/24/2017	100	12.5	25	2.4	8.16	8.00	6.75	1.65	600	20575
7/25/2017	100	24.0	25	2.4	8.60	8.61	5.34	1.26	1200	0
7/26/2017	100	11.1	25	2.4	8.60	8.61	7.50	1.20	1200	13227
7/27/2017	--	--	--	--	--	--	--	--	--	--
7/28/2017	--	--	--	--	--	--	--	--	--	--
7/29/2017	120	13.5	25	2.4	8.56	8.25	13.54	1.60	600	0
7/30/2017	120	8.75								
7/30/2017	100	15.25	25	2.4	8.31	8.29	4.01	1.62	4800	0
7/31/2017	100	24.0	25	2.4	8.29	8.26	5.67	1.68	3600	0
8/1/2017	100	12.6	50	2.4	8.29	8.33	11.12	2.22	5600	0
8/2/2017	100	1.05	50							
8/2/2017	123	1.17	33							
8/2/2017	143	14.3	33							
8/3/2017	143	16.4								
8/3/2017	75	7.6	33	2.4	8.30	8.32	6.19	1.84	9620	9417
8/4/2017	75	15.2								
8/4/2017	100	5.8	33	2.4	8.49	8.49	12.98	2.29	8450	0
8/5/2017	100	3.3	33							
8/5/2017	75	12.3	25 / 33	2.4	8.66	8.46	8.39	2.00	7400	0
8/6/2017	75	23.4	33	2.4	8.51	8.38	8.39	2.09	3000	0
8/7/2017	75	--								
8/7/2017	100	7.9	33	2.4	8.64	8.56	8.21	1.84	15900	23642
8/7/2017	110	6.4								
8/8/2017	110	7.6								
8/8/2017	100	13.2	33 / 25	2.4	8.55	8.48	11.10	1.64	12600	0
8/9/2017	100	21.1								
8/9/2017	125	2.9	25	2.4	8.50	8.51	0.75	1.54	8625	15086
8/10/2017	100	9.5								
8/10/2017	125	7.5	25 / 20	2.4	8.52	8.40	3.22	1.31	12500	0
8/10/2017	150	5.8								
8/11/2017	125	12.0								
8/11/2017	150	1.5	20	2.4	8.51	8.27	0.76	1.47	2200	0
8/12/2017	90	0.1								
8/13/2017	90	10.8								
	120	4.2	20	2.4	8.53	8.53	1.50	1.40	3000	0
8/14/2017	90	8.0								
	140	4.7	20	2.4	8.48	8.47	1.37	1.37	8100	15441
8/15/2017	150	1.00								
	100	9.3	25	2.4	8.52	8.56	1.46	1.51	1500	0
8/16/2017	100	9.4								
	125	14.6	25	2.4 / 2.0	8.51	8.53	4.73	1.22	600	13843
8/17/2017	125	17.3								
	150	6.7	25	2.0 / 2.4	8.50	8.52	6.94	1.17	1800	0
8/18/2017	125	15.8								
	140	8.2	25	2.4	8.50	8.45	7.06	1.15	600	0
8/19/2017	140	7.8								
	150	2.7	25	2.4	8.49	8.42	9.11	1.14	--	0
8/20/2017	0	0.0	--	--	--	--	--	--	--	0
8/21/2017	70	1.3								
	90	11.2	25	2.4	8.28	8.26	8.26	2.80	1200	NA ^e
8/22/2017	90	8.6								
	125	2.6	25	2.4	8.29	8.26	3.94	2.61	4200	0
	143	12.8								
8/23/2017	143	22.4	25 / 30	2.4	8.28	8.37	4.17	2.66	6975	NA ^e
8/24/2017	100	0.4								
	143	9.4	30	2.4	8.29	8.38	11.13	2.52	13495	0
8/25/2017	143	5.9	30							
	90	7.1	25	2.4	8.31	8.29	2.00	2.56	11500	0

Notes:

^a The hours of operation are when the HDS Treatment Plant is actively discharging to Leviathan Creek.

^b The average of the in-line pH probe measurements is presented. The Reactor Tank pH set point was 8.3 from July 22 through July 24, 2017. It was increased to 8.6 from July 24 through July 27, 2017 because the HDS Treatment Plant was treating primarily Channel Underdrain and Delta Seep water. It returned to 8.3 from July 27 through August 4, 2017 because the HDS Treatment Plant began treating combined water again. It was increased to 8.5 on August 4, 2017, to gather data operating at a higher pH setpoint with combined water. The pH setpoint was reduced back to 8.3 on August 21, 2017 and remained there for the rest of the test.

^c The average of the in-line turbidity meter measurements is presented.

^d The average of the in-line lime utilization rate based on the mass of lime dosed and the influent flow rate is presented.

^e The disposal facility has not yet provided the final sludge bin weight tickets.

Abbreviations:

-- = not measured or not applicable

gpm = gallon per minute

L = liter

ppm = part per million

g = gram

kg = kilogram

NA = Not Available

s.u. = standard unit